REMARKS

The Office Action dated May 12, 2004 has been read and carefully considered and the present Amendment submitted in order to clarify the claim language with respect to the cited references.

In that Office Action, claims 1-2, 10, 12, 18-20, 30-32, 35, 39, 46-48 and 50-51 were rejected under 35 U.S.C. 102(e) as being clearly anticipated by Persyk *et al*, U.S. Patent 6,238,027. Claims 1-2, 12, 15-19, 28, 30-31, 35-37, 30-44 and 46-47 were rejected under 35 U.S.C. 102(e) as being clearly anticipated Brown, U.S. Patent 6,037,168. Claims 1-2, 15-19, 15?, 28, 30-31, 35-37, 39-44 and 46-47 were rejected under 35 U.S.C. 102(b) as being clearly anticipated by Chandler, U.S. Patent 5,869,345 or Bogart *et al*, U.S. Patent 5,468,606. Claims 1-2, 15-19., 28, 30-31, 34-37, 39-44 and 46-47 were rejected under 35 U.S.C. 102(b) as being clearly anticipated by Jacobson *et al*, U.S. Patent 4,260,687. Claims 1-2, 15-19, 28, 30-31, 39-44 and 46-47 were rejected under 35 U.S.C. 102(e) as being clearly anticipated by Shields *et al*, U.S. Patent 6,033,627. Claims 1-2, 15-16, 18-19, 28, 30-31, 39-40 and 46-47 were rejected under 35 U.S.C. 102(e) as being clearly anticipated by Ozbey *et al*, U.S. Patent 6,186,403.

Next, claims 10-11, 13-14, 20, 32-33 and 48-51 were rejected under 35 U.S.C. 103 (a) as being unpatentable over Jacobson *et al*, Shields *et al*, Chandler, Bogart *et al*, Brown or Persyk *et al*. Finally, claim 45 was rejected under 35 U.S.C. 103 (a) as being unpatentable over Ozbey *et al*, Jacobson *et al*, Shields *et al*, Chandler, Bogart *et al* or Brown in view of Marker *et al*, U.S. Patent 4,85,110.

Applicant appreciates the telephonic interview with Examiner Alexander and the helpful suggestions of limiting the method claims to be applicable to light in the infrared spectrum and also to add a negative limitation in the method claims to the effect that substantially no optical polishing step has been undertaken. To that end, Applicant has now defined the infrared energy in the specification to be that energy that is illustrated in the various spectra provide as Figures 1-5 to the specification, that is, from about 4400cm^{-1} to about

450cm^{-1}. In addition, a negative limitation has been added to the method claims to the effect that the infrared light transmissive surfaces of the substrate have not undergone precision optical polishing.

While only the method claims were discussed during that telephone interview, Applicant has now also amended the apparatus claims in this application to include the same or similar limitations.

Accordingly, with respect to the apparatus claims, claim 1 has now been amended to describe the substrate where the infrared light is allowed to pass therethrough and which is, therefore, distinguishable over the cited references and also that the substrate has not been precision optically polished. As described in the specification, it is necessary, in the use of IR spectroscopy that the infrared light pass completely through the substrate on which the sample has been placed, such that the infrared light can pass unimpeded from the infrared light source to the infrared light detector. There is, therefore, a physical difference with the present substrate, as produced, over the devices of the cited references where infrared light in general is not employed and where the light does not pass through the sample and the substrate in order to carry out an analysis of the sample. That need to pass the infrared light entirely through the substrate is more defined in claim 2 that now recites the presence of a holder that has a clear aperture so that the infrared light can pass through the holder through the clear aperture and also through the sample contained on the substrate. Thus the present invention and the need to have the substrate along a clear, unimpeded path for the infrared light is different from the references where there may be glass or other substances that would thwart the very purpose of the infrared analysis by preventing the unimpeded passage of the infrared light from the infrared light source to the infrared light detector. The use of glass (which absorbs infrared light) in the path of the infrared light from source to detector renders an infrared spectrophotometer or filtometer basically ineffective because the glass creates absorbance peaks that mask the results of the analysis of the sample.

Taking, now, the cited references, Persyk is related to a saw for cutting scintillator materials and therefore has no relation to the use of materials that are transmissive to infrared

light, nor would there be any reason to utilize such materials in a scintillator. Thus, while Persyk does use a sawing technique for cutting scintillator material, those materials are far different and are prepared in different manners that the materials that are used in an infrared spectrophotometer and which must be transmissive to infrared light and which are produced by methods totally different than that described in Persyck.

In the Brown, Chandler, Bogart, Jacobsen and Shields references, initially, it should be noted that all of these references are directed to fields that are not related to infrared spectroscopy. None of the references discloses or suggests a method of making a material that is transmissive to infrared light or to a completed substrate prepared in the manner of Applicant's disclosure. The present invention relates specifically to the materials that must transmit infrared light and which materials do not include glass, and it is therefore submitted that one desiring to prepare a substrate for infrared spectroscopy would not look to unrelated materials for the preparation of the substrate where the finished product would be inherently unsuited for that purpose.

Accordingly, taking the references individually, Brown refers to glass as a material used and which illustrates the inapplicability of the field of the Brown disclosure since glass is not suitable for use in infrared spectroscopy because it materially absorbs infrared light and therefore would create absorbance peaks that mask the results of the analysis. It would, therefore, not be obvious to use the material of Brown or the techniques of Brown to prepare a substrate of a non-absorbing, infrared light transmitting material. Clear glass is not interchangeable with the materials used in infrared spectroscopy, such as KBr, NaCl and KCl. To illustrate the difference in applications of the substrates used in Brown and the present invention, there would be no reason to use the infrared light transmitting material relating to the present invention in the Brown device as there still would be no way to pass infrared light through a substrate inserted into the Brown device.

The Brown device is used to analyse biological samples and could not be used in an application where infrared light is intended to pass through the sample contained on a substrate since the very device of Brown has a bottom which is certainly not transmissive to infrared

light. Note the support, indicated as 62 in Fig. 6 and 42 in Fig. 4 of Brown, is described, alternatively, as printed (Fig. 4) and coated (Fig. 6). In Fig. 8, the support 82 is described to be coated with ink. Thus, as an illustration of the different field and uses, there would be no suggestion in Brown which has nothing to do with infrared spectroscopy, to find a teaching for the preparation of an infrared light transparent material. In essence, the uses of the Brown device are totally different than infrared spectroscopy and the materials are likewise different. There is no suggestion or teaching in Brown of any method of preparing an infrared transmissive material that could be used in infrared spectroscopy.

The same is true of the Chandler reference. The device in Chandler is used in chromatography, not spectroscopy, and again, there is no need for an infrared light transmissive material since there is no way in the Chandler reference to pass infrared light through a substrate containing a sample. As can be seen in Chandler, there is a window 38 that is illustrated in Fig. 1B and is described as a means for seeing the chromatographic medium 20, the detection zone 26 and the control zone 28. It appears that the "window" is no more than a hole for observation and there is no reference to the window being capable of retaining a sample much less being a window capable of transmitting infrared energy. Note that the sample preparation zone 18 is not in the path of the window 38 (Fig. 1B) and that if the device were placed in the path of a beam of infrared light, as in a spectrophotometer, the infrared light would be blocked to that area where the sample is located. Furthermore, there is a reference to a conductive barrier 16 typically attached by "adhesive" (Fig 1A) and the use of adhesive (which is organic) would contaminate the sampling results in infrared spectroscopic samples. Infrared spectroscopic sampling devices do not use adhesives in contact with the sample. Thus the device of Chandler is fundamentally not suited to spectroscopy and the disclosure of Chandler, therefore, has no relevance to the preparation of materials or substrates, or the final resultant substrate, in the field of infrared spectroscopy.

As to the disclosure of a "card" in Chandler, the Chandler device uses the "opposable components" in a totally different manner. First, while the Chandler card is opened, the sample is applied (Fig. 1A). Then the card is closed (Fig. 1B) to bring the opposable sides into contact so that the conductor 42 and the sample contact each other: With the present sample card, if

used to mount the sampling substrates, the card is closed; its function is simply to locate the substrate in the spectrophotometer and thus has a totally different function and structure than the card of Chandler. Also note that Chandler states that the conductor 42 that carries the sample is made from cellulose "or other material that can conduct liquid without substantially absorbing it". Again, cellulose is a material totally unsuitable for use as a sample substrate for infrared spectroscopy in that it creates interference bands or peaks in the infrared spectrum and thus would not be a material that is compatible with or at all usable with infrared spectroscopy.

In the Bogart reference, as in the aforedescribed Brown and Chandler references, the Bogart device could not be used in infrared spectroscopy. It is noted that the Examiner has pointed to Fig. 8 as showing a hinged device, however the present application does not claim a hinge nor is one required. The device of Bogart, Fig. 8, does not disclose a device that will allow infrared light to pass from the infrared light source through the sample to an infrared light detector in a spectrophotometer. Instead, what is described in Bogart, is a test surface 26 on a raised pyramid. That surface is not described as energy transmissive and, in fact, there are several pieces of filter paper 52, 54 and 64 which contact the test surface and the filter papers are of such size as to block all of the apertures or windows of the device. There is simply no disclosure in Bogart of a device or substrate that is transmissive to infrared light from one side of the device to the other and, therefore, there is no disclosure of any method of making such an infrared transmissive material or of the substrate itself.

Next, the Jacobsen reference also is not applicable to a spectrophotometer since, again, there is no means of passing infrared light on a non-absorbing basis from the infrared light source through a sample and then to an infrared light detector in the spectrophotometer. For example, in Fig. 3, there are closed "wells" 13, 17 set on what appears to be a base 42 through which the light energy of a spectrophotometer would not pass. There is also a cover 19 that is brought in contact with surface 42 and the cover 19 is "covered with a bilious or other absorbent material to take up the excess suspension when in the closed position which absorbent material may contain a germicidal agent ...". Again, the condition of the cover is such that it would not only block infrared light but would also create absorbance peaks from the germicidal agent and thus would be totally unsuitable for infrared spectroscopy even if it were

transmissive. Furthermore, the Jacobsen device does not contain any form of transmissive window. There is a mention of the presence and use of a transparent "adhesive film" 43 but such a film would be absorbing of infrared energy and could not be used in a spectrophotometer to transmit infrared light without creating interfering absorbance peaks.

In the Shields reference, as in the other cited references, already discussed, the Shields device has no possible application to infrared spectroscopy sampling to which the present invention relates. The Shields device describes a chromatographic testing device and there is a single window which, like in the Chandler reference, is described (see the description of Figs 1, 2, and 3) as located in the front panel to observe the test results. There is no indication of any window in the back panel through which the light energy of a spectrophotometer could pass from the light source of the instrument and then through the sample and then to the light detector. Further, there is no indication that this "window" is anything more than a hole, that is, there is no description or reference to any window material, far less one that is transmissive of infrared light. Accordingly, the device of Shields is fundamentally unsuited to an infrared spectroscopic application and provides no teaching of how to prepare a substrate that would be usable in an infrared spectrophotometer.

Finally, in the Ozbey reference, the Examiner has characterized Fig. 13 as describing a "plate window" 406, however, it would appear that Fig. 13 is clearly not any different than the other embodiments of the invention taught in Ozbey which simply shows holes in various styles of cards in which a fabric sample is placed in a colorimeter to be analysed. In fact, there is no mention in the description of Fig. 13 to a plate window. Instead, Fig. 13 seems to describe Fig. 13 as "the submit holding plate 400 into which the submit card 100 is inserted". The plate is the means for mounting the card in the colorimeter, not the window which is described as simply a "window" 406 of the submit holding plate; in other words, a hole.

Accordingly, it is submitted that none of the cited references is relevant to the field of infrared spectroscopy and to the specific materials used in that field. Such references, therefore, do not disclose methods of making the specific materials that are used in infrared spectroscopy where the material must, of necessity, be transmissive to the infrared light energy

and not have other interfering materials that create interfering peaks so as to be totally unsuited for such use. With the present invention, however, the materials are usable in infrared spectroscopy and the claims are now limited to that field and the materials are suited for the transmissive qualities and properties required in infrared analysis and not in other fields such as scintillators, chromatographs or biological analysers.

It is therefore submitted that the claims, now limited to use in infrared analysis, are patentable over the cited references and an allowance of the present application is respectfully solicited.

Respectfully submitted,

Roger M. Rathbun

Attorney for Applicant